Sent via email and U.S. certified mail

April 20, 2020

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Re: 60-Day Notice of Endangered Species Act Violations Regarding the Lake Okeechobee Regulation Schedule

Dear Madam and Sirs:

This letter notifies the U.S. Army Corps of Engineers (Corps) and National Marine Fisheries Service (NMFS) of the intent of the Center for Biological Diversity, Calusa Waterkeeper, and Waterkeeper Alliance to sue for violations of the Endangered Species Act (ESA), 16 U.S.C. § 1531, *et seq*., regarding the Lake Okeechobee Regulation Schedule (LORS). The Corps and NMFS violated and continue to be in violation of the ESA because of NMFS' issuance of and the Corps' reliance upon NMFS' unlawful 2020 concurrence letter regarding LORS.

This letter is provided pursuant to the sixty-day notice requirement of the citizen suit provision of the ESA.[1] The Corps and NMFS have sixty days to remedy the violations identified herein; if these violations are not cured within the sixty day notice period, the undersigned parties intend to file suit in federal court.

[1] 16 U.S.C. §§ 1540(g).

I. ORGANIZATIONS GIVING NOTICE

The names, addresses, and phone numbers of the organizations giving notice of intent to sue under the ESA are:

Center for Biological Diversity
P.O. Box 2155
St. Petersburg, Florida 33731
(727) 490-9190

Calusa Waterkeeper
P.O. Box 1165
Fort Myers, FL 33902
(239) 633-7274

Waterkeeper Alliance
180 Maiden Lane, Suite 603
New York, NY 10038
(212) 747-0622 x. 132

II. THE ENDANGERED SPECIES ACT

The ESA, by way of its "language, history, and structure . . . indicates beyond doubt that Congress intended endangered species to be afforded the highest of priorities" for protection under the law.[2] The purpose of the Endangered Species Act is in part "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved [and] to provide a program for conservation of such endangered and threatened species."[3] The secretaries of Interior and Commerce administer the ESA through FWS and NMFS respectively. FWS has jurisdiction over terrestrial species, non-marine aquatic species, and certain marine species while on land. NMFS has jurisdiction over marine species and most anadromous fish.

To fulfill the substantive purpose of the ESA, federal agencies are required to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the adverse modification of [the critical] habitat of such species."[4] An action will cause "jeopardy" if it "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."[5]

The first step in the Section 7 process is for the agency authorizing the project to determine if the proposed action "may affect" an endangered or threatened species.[6] If the agency determines the action will not affect a listed species, and NMFS concurs, no further action is required. If, on the other hand, the action agency has determined that the proposed action "may affect" a listed species or critical habitat, it may initiate "informal consultation" with NMFS.[7] If during this

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[2] *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 174 (1978).
[3] 16 U.S.C. § 1531(b).
[4] *Id.* § 1536(a)(2).
[5] 50 C.F.R. § 402.02.
[6] *Id.* § 402.02.
[7] *Id.* § 402.13.

process it is revealed that the action is "likely to adversely affect" a listed species or critical habitat, formal consultation is required.[8]

The formal consultation process requires a written statement, known as a "biological opinion," setting forth the Secretary's opinion detailing how the agency action affects the species or its critical habitat.[9] After NMFS analyzes the direct, indirect and cumulative effects of the proposed action it makes a finding as to whether the action "is likely to jeopardize the continued existence of the species."[10] If it determines that the action will jeopardize a species or adversely modify the species' critical habitat, the biological opinion must list any "reasonable and prudent alternatives" to the proposed action that would not result in jeopardy to the species.[11]
If NMFS concludes that the action or the RPAs will not cause jeopardy, but may result in the take of a listed species, NMFS must issue an incidental take statement (ITS) that specifies "the impact, i.e., the amount or extent, of . . . incidental taking" that may occur.[12]

To "take" an endangered or threatened species means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" it, or "to attempt to engage in any such conduct."[13] "Harm" includes significant habitat modification or degradation that results in death or injury to listed species "by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering."[14] "Harass" is defined as intentional or negligent actions that create a likelihood of injury to listed species "to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering."[15] Congress intended the term "take" to be defined in the "broadest possible manner to include every conceivable way" a person could harm or kill fish or wildlife.[16]

An ITS must include "reasonable and prudent measures . . . necessary . . . to minimize such impact,[17] and must specify the permissible level of taking, "thus . . . serv[ing] as a check on the agency's original decision that the incidental take of listed species resulting from the proposed action will not [jeopardize the continued existence of the species]."[18]

Compliance with the biological opinion and its incidental take statement protects federal agencies, and others acting under the biological opinion, from enforcement action under Section 9's prohibition against take;[19] however, take not in compliance with a biological opinion or absent a valid take statement or take permit is in violation of Section 9 of the ESA.

Even after the procedural requirements of a consultation are complete, the ultimate duty to

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[8] *Id*. § 402.12(j).
[9] 16 U.S.C. § 1536(b)(3)(A); 50 C.F.R. § 402.02.
[10] 16 U.S.C. § 1536(b).
[11] *Id*. § 1536(b)(3)(A).
[12] 50 C.F.R. § 402.14(h)(3).
[13] 16 U.S.C. § 1532(19).
[14] 50 C.F.R. § 17.3.
[15] *Id.*
[16] *See* S. Rep. No. 93-307, at 7 (1973), *as reprinted in* 1973 U.S.C.C.A.N. 2989, 2995.
[17] 16 U.S.C. § 1536(b)(4).
[18] *Id.*; *Center for Biological Diversity v. Salazar*, 695 F.3d 893, 911 (9th Cir. 2012).
[19] 16 U.S.C. §§ 1536(o)(2); 1538(a); 50 C.F.R. § 17.31(a).

ensure that an activity is not likely to cause jeopardy to a listed species lies with the action agency. An action agency's reliance on an inadequate, incomplete, or flawed biological opinion cannot satisfy its duty to avoid the likelihood of jeopardy to listed species.[20]

III. THE CORPS' HARMFUL LAKE OKEECHOBEE DISCHARGES TO THE CALOOSAHATCHEE & ST. LUCIE ESTUARIES

Lake Okeechobee and the rivers that drain it to the Gulf of Mexico and Atlantic Ocean – the Caloosahatchee and St. Lucie, respectively – help sustain the greater Everglades region. Nearly 730 square miles, Lake Okeechobee (Lake) is often referred to as the "liquid heart" of the Everglades. The 67-mile long Caloosahatchee River travels from the Lake through Glades, Hendry, and Lee counties, before emptying into the Gulf of Mexico as a highly important resource for biodiversity. The river and estuary are home to the largest known pupping grounds of the federally endangered smalltooth sawfish. Five species of ESA-listed sea turtles - loggerhead, green, Kemp's ridley, hawksbill, and leatherback - frequent the estuary and nearby Gulf of Mexico. The St Lucie River and estuary is a 7-mile long system that makes its way from Lake Okeechobee through St. Lucie and Martin counties where it meets up with the greater Indian River Lagoon system, which is recognized as one of the most diverse estuarine environments in North America with more than 4,300 plants and animals. Sea turtles, smalltooth sawfish, giant manta rays, Johnson's seagrass, and boulder, mountainous star, lobed star, elkhorn and staghorn coral are found off the coast in and near the estuary's outlet.

The Corps flushes large volumes of water out to the estuaries and these discharges carry a tremendous amount of nutrients, and sometimes harmful blue-green algae.[21] In 2018, the Corps discharged twice as much water and nitrogen, and nearly three times as much phosphorous as its 20-year average from the Lake to the estuaries.[22] Specifically, the Corps discharged 1,346 tons of nitrogen and 161 tons of phosphorous from the Lake to the St. Lucie (as compared to its 1997-2018 annual average of 572 and 60 tons, respectively),[23] and 2,155 tons of nitrogen and 195 tons of phosphorous from the Lake to the Caloosahatchee (as compared to its 1997-2018 annual average of 1,091 and 74 tons, respectively.[24]

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[20] *See, e.g.*, *Florida Key Deer v. Paulison*, 522 F.3d 1133, 1145 (11th Cir. 2008) (action agency must independently ensure that its actions are not likely to cause jeopardy); *Pyramid Lake Tribe of Indians v. U.S. Dep't of Navy*, 898 F.2d 1410, 1415 (9th Cir. 1990) (same).

[21] Havens, K. 2013. Deep Problems in Shallow Lakes: Why Controlling Phosphorus Inputs May Not Restore Water Quality. IFAS Extension. University of Florida; Havens, K, et al. 2016. Natural Climate Variability Can Influence Cyanobacteria Blooms in Florida Lakes and Reservoirs. IFAS Extension. University of Florida; South Florida Water Management District. 2018. Central Everglades Planning Project Post Authorization Change Report: Feasibility Study and Draft Environmental Impact Statement. (SFWMD 2018b).

[22] Armstrong, C. et al. 2019. Chapter 8C: St. Lucie and Caloosahatchee River Watersheds Annual Report.

[23] *Id.* at 8C-10, Table 8C-2.

[24] *Id.* at 8C-27, Table 8C-9.

Table 8C-2. Summary of freshwater inflow in million acre-feet per year (10^6 ac-ft/yr) and TN loads and TP loads in metric tons per year (t/yr) from Lake Okeechobee, the St. Lucie Basin (C-23, C-24, C-44, and TMC) and the Tidal Basin (ungauged) to the SLE.

		WY1997–W2018	WY2016	WY2017	WY2018
Inflow (10^6 ac-ft/yr)	**Total**	**1.01**	**1.22**	**0.95**	**1.58**
	Lake Okeechobee	0.26	0.37	0.34	0.59
	St. Lucie Basin	0.49	0.59	0.37	0.67
	Tidal Basin	0.26	0.26	0.24	0.32
TN (t/yr)	**Total**	**1,779**	**1,991**	**1,376**	**3,135**
	Lake Okeechobee	572	717	621	1,346
	St. Lucie Basin	906	970	497	1,400
	Tidal Basin	301	304	258	390
TP (t/yr)	**Total**	**327**	**333**	**230**	**556**
	Lake Okeechobee	60	84	57	161
	St. Lucie Basin	222	219	144	350
	Tidal Basin	45	31	29	45

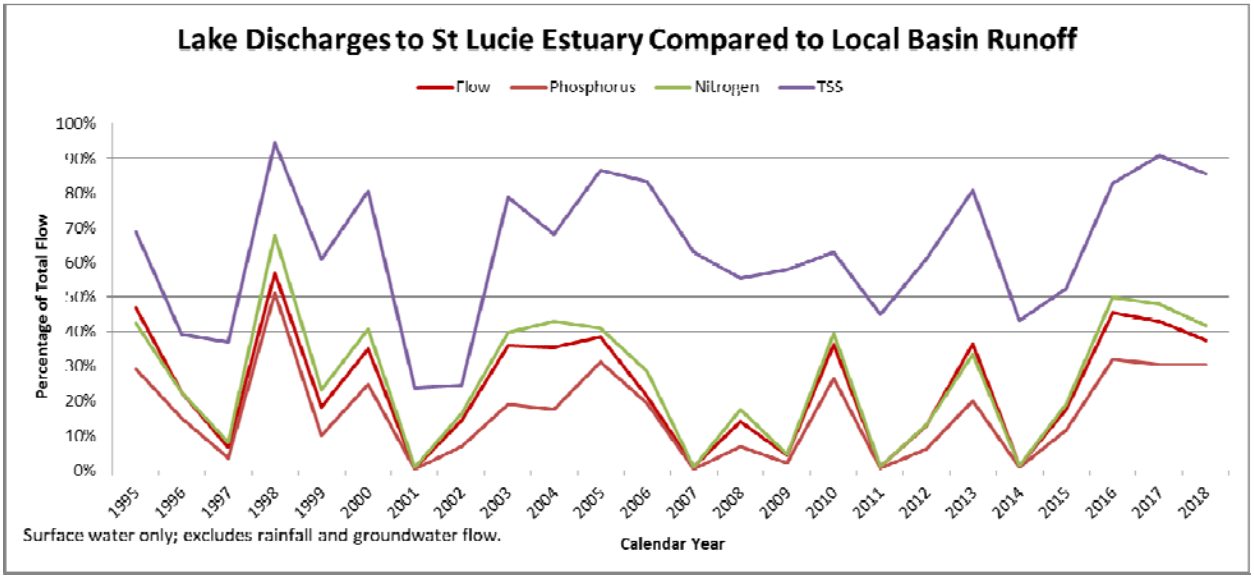
Table 8C-9. Summary of freshwater inflow in million acre-feet per year (10^6 ac-ft/yr) and TN loads and TP loads in metric tons per year (t/yr) from Lake Okeechobee, the C-43 Basin (C-23, C-24, C-44, and Ten Mile Creek) and the Tidal Caloosahatchee Basin (ungauged) to the SLE. Shown in the table are the long-term averages (WY1997–WY2018) and values for WY2016, WY2017 and WY2018.

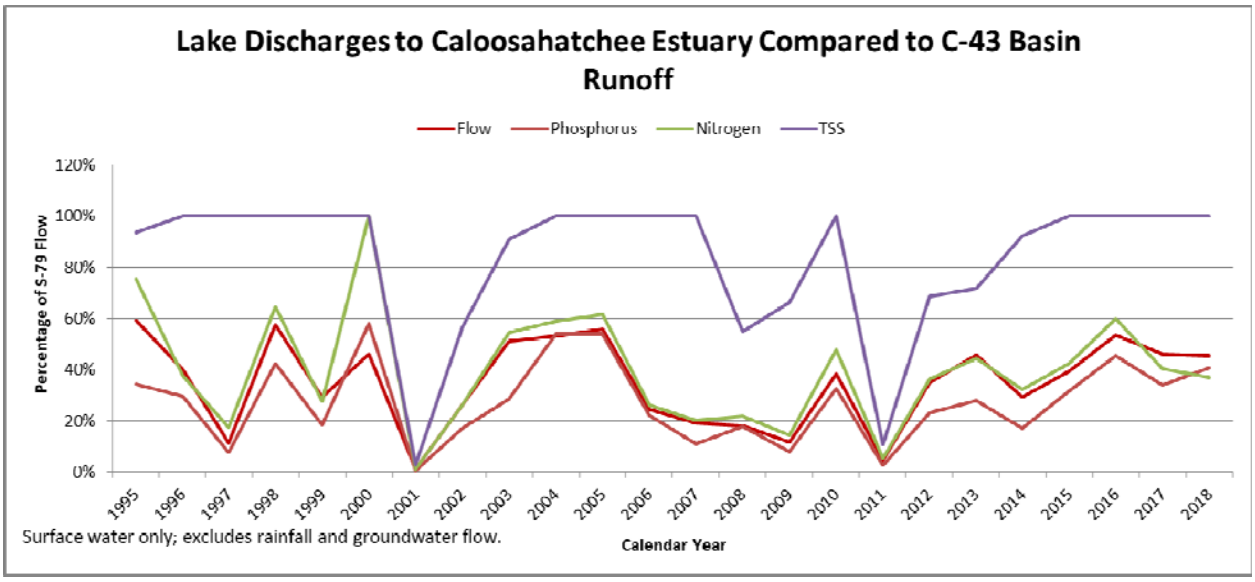
		WY1997-2018	WY2016	WY2017	WY2018
Inflow (10^6 ac-ft/yr)	**Total**	**1.88**	**2.38**	**2.33**	**3.06**
	Lake Okeechobee	0.62	0.85	1.01	1.20
	C-43 Basin	0.88	0.96	0.93	1.39
	Tidal Caloosahatchee Basin	0.38	0.57	0.39	0.47
TN (t/yr)	**Total**	**3,070**	**3,567**	**3,417**	**5,329**
	Lake Okeechobee	1,091	1,590	1,559	2,115
	C-43 Basin	1,545	1,350	1,465	2,641
	Tidal Caloosahatchee Basin	434	627	393	573
TP (t/yr)	**Total**	**297**	**302**	**317**	**643**
	Lake Okeechobee	74	106	104	195
	C-43 Basin	177	140	175	373
	Tidal Caloosahatchee Basin	47	56	38	76

Information provided by Dr. Gary Goforth,[25] with data collected from the South Florida Water Management District's corporate environmental database - DBHYDRO, shows that Lake Okeechobee discharges have a significant impact on the estuaries. The annual phosphorous, nitrogen, and total suspended solids discharges from the Lake to the estuaries during wet years are significant as compared to basin runoff, contributing a greater percentage of total phosphorous, nitrogen, and suspended solids than average during those wet years. From 1980-2018, the annual average percent of phosphorous from the Lake to the St. Lucie, as compared to

[25] Goforth, G. 2019. Resume. Dr. Goforth has more than 25 years of experience in water resources engineering, including large-scale environmental restoration programs in the Kissimmee-Okeechobee-Everglades ecosystem.

local basin runoff, was 15%, with significant spikes under LORS 2008 in 2010 (27%), 2013 (20%), 2016 (32%), 2017 (30%), and 2018 (31%). From data taken at the S-77, Lake discharge of phosphorous to the Caloosahatchee estuary as compared to C-43 basin runoff average was 21%, with significant spikes under LORS 2008 in 2010 (33%), 2012 (23%), 2013 (28%), 2015 (32%), 2016 (45%), 2017 (34%), and 2018 (40%). From 1980-2018, the annual average percent of nitrogen from the Lake to the St. Lucie, as compared to local basin runoff, was 23%, with significant spikes under LORS 2008 in 2010 (39%), 2013 (33%), 2016 (50%), 2017 (48%), and 2018 (42%). From data taken at the S-77, Lake Okeechobee discharge of nitrogen to the Caloosahatchee estuary as compared to C-43 basin runoff average was 32%, with significant spikes under LORS 2008 in 2010 (48%), 2012 (23%), 2013 (44%), 2015 (42%), 2016 (60%), 2017 (40%), and 2018 (37%). From 1980-2018, the annual average percent of total suspended solids from the Lake to the St. Lucie, as compared to local basin runoff, was 56%, with significant spikes under LORS 2008 in 2010 (63%), 2013 (81%), 2016 (83%), 2017 (91%), and 2018 (85%). From data taken at the S-77, Lake Okeechobee discharge of total suspended solids to the Caloosahatchee estuary as compared to C-43 basin runoff average was 64%, with significant spikes under LORS 2008 in 2010 (100%), 2012 (69%), 2013 (72%), 2015 (100%), 2016 (100%), 2017 (100%), and 2018 (100%).





Therefore, while there are other sources of flow and nutrients to the estuaries, LORS significantly and directly influences the estuaries, particularly in wet years. In addition to flow and nutrients, LORS contributes blue-green algae to the estuaries.[26] The amount of cyanotoxins in Florida's waters is astonishing and the frequency, duration, and geographic scope of these HABs appear to be on the rise. There were several large-scale blooms of blue-green algae under LORS in 2016 and 2018.[27] From May 4 to August 4, 2016 the Department took approximately 200 water samples from the St. Lucie River and estuary, Caloosahatchee River and estuary, Lake Okeechobee, Indian River Lagoon, and other nearshore waters.[28] Microcystin concentrations ranged from below the detection limit to 414.3 micrograms per liter.[29] Among the species identified were *Microcystis aeruginosa*, *Scrippsiella trochoidea*, *Planktolyngbya limnetica*, *Dolichospermum circinalis*, and *Plectonema wollei*.[30] Once these toxic cells reached the St. Lucie estuary, *M. aeruginosa* continued to grow due to slow water movement and extended residence times.[31]

In 2017, samples had the highest recorded concentration of microcystin collected in the past five years.[32] In August 2018, the Department collected water samples with toxic algae at the rate of 110 parts per billion, 10 times the level the World Health Organization has determined to be

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[26] DeLuca, D. and A.B. Williams. July 12, 2019. With health impacts in the foreground of water quality conversation, Army Corps acknowledges toxic algae and nutrients in Lake O releases. The News-Press. https://www.news-press.com/story/news/2019/07/12/army-corps-engineers-admits-dumping-toxic-water-lake-okeechobee/1716073001/.

[27] Philips, E. et al. 2012. Climatic Influences on Autochthonous and Allochthonous Phytoplankton Blooms in a Subtropical Estuary, St. Lucie Estuary, Florida, USA.

[28] EPA 2016 at 28.

[29] *Id*.

[30] *Id*.

[31] Preece, E.P., F.J. Hardy, B.C. Moore, and M. Bryan. 2017. A Review of microcystin detections in estuarine and marine waters: environmental implications and human health risk, Harmful Algae 61: 31-45.

[32] Zhang, J. et al. 2018. Chapter 8B: Lake Okeechobee Watershed Research and Water Quality Monitoring Results and Activities in 2018 South Florida Environmental Report – Volume I.

hazardous for humans in recreational waters.[33] Testing had detected even higher levels in July 2018 at 154.38 PPB and 33,000 PPB in 2016.[34] Schaefer (2019) found when the Corps discharges large volumes of the microcystin-contaminated water that has bloomed in the Lake, microcystin persists in the estuaries which become lower-salinity due to the discharges, and that the "negative environmental and economic effects will likely continue until better management solutions are developed."[35]

During this same time frame as the blue-green algae blooms precipitated by LORS, a massive red tide bloom started in October 2017 and persisted well beyond November 2018. It spanned from the Florida panhandle in Okaloosa, Walton, Bay and Franklin counties to the southern tip of Florida and up the Atlantic coast.[36] By October 2018, red tide and its associated fish kills had closed beaches in Pinellas, Manatee, Sarasota, Lee, Collier, Escambia, Okaloosa, Brevard and Indian River counties.[37] Concentrations of more than 1 million *K.brevis* cells per liter were observed in Pinellas, Hillsborough, Manatee, and Sarasota counties by November 2018.[38] Governor Scott declared a state of emergency, and by August 2018, thousands of tons marine life killed by the bloom had been removed, costing tax-payers millions of dollars.[39]

There have been numerous descriptions of mammal and bird mortalities associated with exposure to cyanobacteria.[40] HABs may have both direct and indirect impacts to fish and wildlife from the bottom of the food chain up.[41] Cyanotoxins can influence the structure of zooplankton communities and reduce the filtration capacity and survival of offspring.[42] Ingestion of microcystins can result in lethal poisoning.[43] Cyanotoxins can also inhibit the growth of underwater plants, and adversely affect aquatic invertebrates such as mollusks by reducing food intake, filtration, absorption and fecal loss, and the scope for growth.[44]

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[33] Wright, P. 2018. Florida's Blue-Green Algae Bloom 10 Times Too Toxic to Touch, Testing Shows. Aug. 10, 2018. Weather.com (Wright 2018).
[34] *Id*.
[35] Schaefer, A. et al. 2019. Integrated observing systems: An approach to studying harmful algal blooms in south Florida, Journal of Operational Oceanography, DOI: 10.1080/1755876X.2019.1606879.
[36] Keiek, B. Red tide update for Northwest Florida. Mynbc15.com (Nov. 1, 2018); Jones, C. 2018. Could toxic red tide move farther north to St. Johns County? The St. Augustine Record. Oct. 8, 2018.
[37] Murphy. 2018. Red tide is spreading in Florida. Hurricane Michael didn't stop it. CNN. Oct. 18, 2018.
[38] Ballogg, R. 2018. Red tide remains strong on Anna Maria Island. Bradenton Herald. Nov. 1, 2018.
[39] Murphy, P. 2018. Red tide just spread to Florida's Atlantic coast, choking some the most popular beaches. CNN. Oct. 5, 2018.
[40] EPA 2016 at 75. The National Oceanic Atmospheric Administration collected data on unusual mortality events finding that 41 percent of marine mammal deaths 1991-2013 were due to HAB toxin exposure. Schaefer, A. et al. 2019. Integrated observing systems: An approach to studying harmful algal blooms in south Florida. Journal of Operational Oceanography, DOI: 10.1080/1755876X.2019.160687; National Oceanic and Atmospheric Administration.
2013. Marine mammal unusual mortality events 1991–2013. http://www.nmfs.noaa.gov/pr/health/immune.
[41] Hillborn, E.D. and V.R. Beasley. 2015. One health and cyanobacteria in freshwater systems: animal illnesses and deaths are sentinel events for human health risks, Toxins, 1374-1395, doi: 10.3390/toxins7041374.
[42] Zanchett, G. and E.C. Oliveira-Filho. 2013. Cyanobacteria and cyanotoxins: from impacts on aquatic ecosystems and human health to anticarcinogenic effects, Toxins 5(10): 1896-1917, doi: 10:3390/toxins5101896.
[43] *Id*.
[44] *Id*.

Fish can be exposed to microcystins while feeding or through the gills during breathing.[45] Fish in the early life stages are generally more sensitive.[46] HABs can result in damage to the liver, hearth, kidney, skin, gills, and the spleen.[47] Microcystins can induce disruption of the cytoskeletal network of the liver, leading to massive pool of blood, followed by sinusoid destruction and ultimately death as a result of hepatic hemorrhaging.[48] HABs can induce high pH and ammonia from the decomposition of cyanobacteria, causing damage to fish gills.[49] This gill damage may enhance microcystin uptake, leading to liver necrosis.[50] Aquatic animals may die as a result of toxins from cells or a reduction in the amount of dissolved oxygen from the bloom decay process.[51]

Cyanotoxins can bioaccumulate in aquatic invertebrates and aquatic vertebrates and cyanotoxins may be transported through the food web.[52] Cyanotoxins can accumulate in zooplankton and aquatic invertebrates, thereby affecting fish that feed on plankton.[53] Piscivorous birds in turn consume cyanotoxins in the contaminated fish.[54] There has been increasing concern about HABs in wildlife refuges and other areas where animals, especially birds, congregate in large numbers.[55] Meanwhile, from July 2018 - December 6, 2018, 126 bottlenose dolphins have stranded due to exposure to red tide.[56] Certain cyanotoxins, like *Microcystis aeruginosa*, release cellular microcystin into the environment when they reach the marine environment.[57]

The Corps states that "There have been no marine mammal mortalities linked to the freshwater toxins normally found in Florida,"[58] yet BMAA concentrations of animals exposed to cyanobacteria have been observed in Florida, including low-level exposure in bottlenose dolphins with potential toxic and immune health impacts in northeast Florida,[59] and moderate amounts in mollusks and high concentrations in fish in the Caloosahatchee River.[60] In 2018, the

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[45] *Id*.
[46] *Id*.
[47] *Id*.
[48] Masango, M.G., J.G. Myburgh, L. Labuschagne, D. Govender, R.G. Bengis, and D. Naicker. 2010. Assessment of *microcystis* bloom toxicity associated with wildlife mortality in the Kruger National Park, South Africa. Journal of Wildlife Diseases, 46(1): 95-102.
[49] Zanchett, G. and Oliveira-Filho, E.C. 2013. Cyanobacteria and cyanotoxins: from impacts on aquatic ecosystems and human health to anticarcinogenic effects, Toxins 5(10): 1896-1917, doi: 10:3390/toxins5101896.
[50] *Id*.
[51] J. S. Metcalf, S.A. Banack, J.T. Powell, F.J.M. Tymm, S.J. Murch, L.E. Brand, and P.A. Cox. 2018. Public health responses to toxic cyanobacterial blooms: perspectives from the 2016 Florida event, Water Policy 20 (5): 919-932.
[52] Williams, C.D., J. Burns, A. Chapman, M. Pawlowicz, and W. Carmichael. 2006. Assessment of Cyanotoxins in Florida's Surface Waters and Associated Drinking Water Resources, Final Report, 29, April 11, 2006;
[53] Lopez-Rodas, E. Maneior, M.P. Lanzarot, N. Perdigones, and E. Costas. 2008. Mass wildlife mortality due to cyanobacteria in the Donana National Park, Spain, Veterinary Record 162: 317-318, doi:10.1136/vr.162.10.317.
[54] *Id*.
[55] *Id*.
[56] NOAA 2018.
[57] Rosen, B.H. 2018. Understanding the effect of salinity tolerance on cyanobacteria associated with a harmful algal bloom in Lake Okeechobee, Florida: U.S. Geological Survey Scientific Investigations Report 2018-5092, 32 p., http://doi.org/10.3133/sir20185092.
[58] Draft EA 1-7.
[59] Brown, A. et al. 2018. Detection of cyanotoxins (microcystins/nodularins) in livers from estuarine and coastal bottlenose dolphins (*Tursiops truncatus*) from Northeast Florida. Harmful Algae Vol. 76, June 2018, p. 22-34.
[60] Brand 2010.

Ocean Research and Conservation Association (ORCA) analyzed 54 fish caught in Martin County.[61] Researchers found that 27.8% of fillets and 69.8% of livers contained microcystin concentrations above established detection limits.[62] The average microcystin level in fillets was 7.4 ng/g with a range of 0.8-39 ng/g. and the average microcystin level of liver samples was 17.2 ng/g with a range of 0.6-149 ng/g.[63] ORCA researchers also interviewed 27 subsistence fishers and tested 22 fish from the Port Mayaca locks.[64] Based on these initial findings, subsistence fishers eat 3 to 4 times more fish than the average U.S. citizen and depend on fishing for up to seven meals per week.[65] Most fish caught at the locks had detectable microcystin in the fillets (63.6%) and livers (54.5%) with average levels of 3.1 ng/g and 13.6 ng/g, respectively.[66] ORCA's subsistence fishing study will be completed, with a paper submitted for publication, in the summer of 2019.[67] Bottlenose dolphins can eat similar diets to humans (fish and crustaceans), and those that have died in the Indian River Lagoon have similar concentrations of BMAA in their brains as humans that have died of neurodegenerative diseases.[68]

In a recently published study, researchers at the University of Miami were the first to show detectable levels of BMAA in bottlenose dolphin brains that also displayed degenerative damage similar to Alzheimer's, Lou Gehrig's disease, and Parkinson's disease in humans.[69] The dolphins studied included seven that beached themselves in 2005 along the Atlantic, the Indian River Lagoon, the Banana River and Gulf of Mexico.[70] Impacted wildlife in Florida have been found to have similar concentrations of BMAA as in impacted wildlife in Guam.[71] Even coral in Florida are being overgrown by cyanobacteria and cyanobacterial diseases.[72]

The blue-green algae have recently been co-occurring with red tide. Red tide with concentrations of *karenia brevis* (at least 100,000 cells/l) is the concentration at which the Florida Fish and Wildlife Conservation Commission (FWC) believes sea turtle mortality due to brevetoxicosis typically begins to occur. It is believed that red tide exposure may pose significant implications for immune function in loggerhead sea turtles,[73] and that red tide "needs to be considered when

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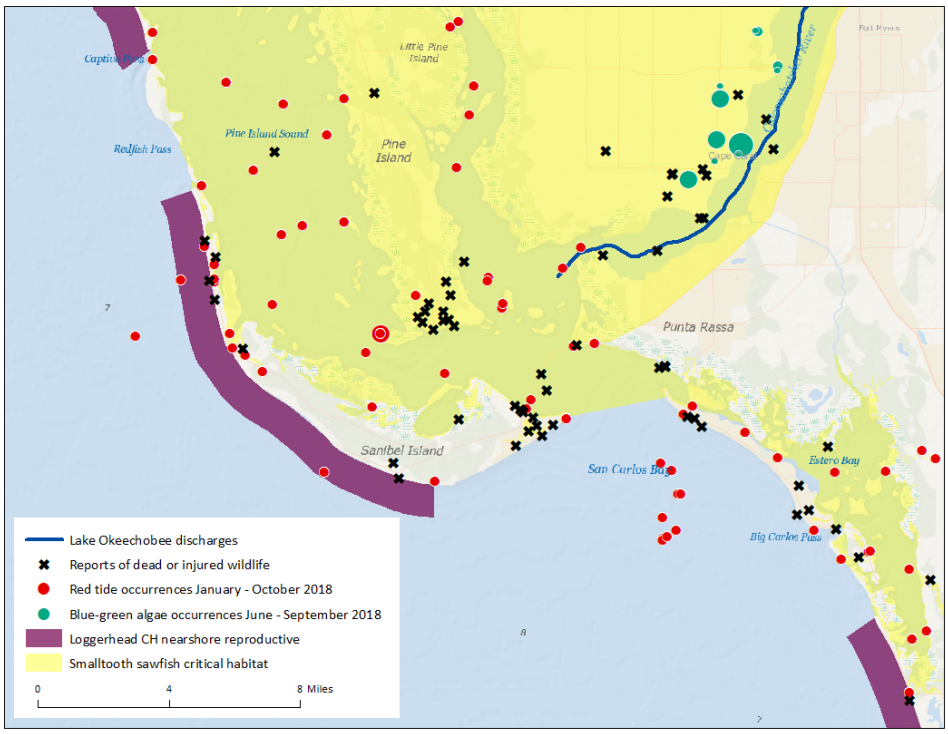
[61] ORCA. 2019. Tracking Cyanotoxins in the Aquatic Food Web in Martin County.
[62] *Id*.
[63] *Id*.
[64] *Id*.
[65] *Id*.
[66] *Id*.
[67] *Id*.
[68] Brand 2009; Brand 2010.
[69] Staletovich, J. 2019. Dolphins poisoned by algae also showed signs of Alzheimer's-like brain disease, Miami Herald, (Mar. 20, 2019) at https://www.miamiherald.com/news/local/environment/article228126094.html; Davis D.A., Mondo K., Stern E., Annor A.K., Murch S.J., Coyne T.M., et al. 2019. Cyanobacterial neurotoxin BMAA and brain pathology in stranded dolphins. PLoS ONE 14(3):e0213346. https://doi.org/10.1371/journal.prone.0213346.
[70] Staletovich, J. 2019. Dolphins poisoned by algae also showed signs of Alzheimer's-like brain disease, Miami Herald, (Mar. 20, 2019) at https://www.miamiherald.com/news/local/environment/article228126094.html; Davis D.A., Mondo K., Stern E., Annor A.K., Murch S.J., Coyne T.M., et al. 2019. Cyanobacterial neurotoxin BMAA and brain pathology in stranded dolphins. PLoS ONE 14(3):e0213346. https://doi.org/10.1371/journal.prone.0213346.
[71] Brand 2009.
[72] Paul, V.J. et al. 2005. Benthic cyanobacterial bloom impacts the reefs of southern Florida (Broward County, USA), Coral Reefs. 2005; 24:693-7; Richardson, L.L. et al. 2003. Ecological physiology of the black band disease cyanobacterium Phormidium corallyticum. FEMS Microbiol Ecol. 2003; 43:287-98.
[73] Walsh, C. 2009. Effects of brevetoxin exposure on the immune system of loggerhead sea turtles. Aquatic Toxicology 97 (2010) 293-303.

managing" sea turtles.[74] Red tide has been positively correlated with tumors on sea turtles,[75] and it is believed that brevetoxins can transfer from mother to hatchling causing sublethal and lethal effects on hatchlings.[76] From Nov. 2017-Dec. 10, 2018 FWC documented 1,260 stranded sea turtles with 577 (250 loggerheads, 263 Kemp's ridleys, and 64 green sea turtles) to red tide, making it the largest number of stranded sea turtles attributed to red tide.[77]

Red tide and blue-green algae blooms individually, collectively, and synergistically killed tens of thousands of tons of marine wildlife, including Endangered Species Act-listed species like sea turtles. There were several months, possibly up to a year, where blue-green algae and red tide occurred at the same time, in habitat used by endangered and threatened sea turtles and smalltooth sawfish.



Map depicting the Caloosahatchee river and estuary, co-occurring red tide and blue-green algae in 2018, reported wildlife casualties, and loggerhead sea turtle and smalltooth sawfish designated critical habitat.

[74] Foley, A.M. et al. 2019. Assessing *Karenia brevis* red tide as a mortality factor of sea turtles in Florida, USA. Diseases of Aquatic Organisms Vol. 132: 109-24, https://doi.org/10.3354/dao03308.
[75] Perrault, J.R. et al. 2017. Potential effects of brevetoxins and toxic elements on various health variables in Kemp's ridley (*Lepidochelys kempii*) and green (*Chelonia mydas*) sea turtles after a red ties bloom event. Science of the Total Environment. Vol. 605-606, Dec. 15, 2017. P. 967-79.
[76] Perrault, J.R. et al. 2016. Maternal transfer and sublethal immune system effects of brevetoxin exposure in nesting loggerhead sea turtles (*Caretta caretta*) from wester Florida. Aquatic Toxicology Vol. 180, Nov. 2016, p. 131-40.
[77] Foley, A. Email. Sea Turtle Stranding and Red Tide. Dec. 10, 2018.

IV. NMFS' UNLAWFUL CONCURRENCE LETTER

NMFS and Corps have informally consulted on LORS three times (2007, 2015, 2020). Each time, NMFS determined that LORS, a massive project that discharges millions of gallons of Lake water – often laden with nutrients, at times carrying toxic algae – to the estuaries, is not likely to adversely affect any listed species or adversely modify their critical habitat. NMFS has never issued a biological opinion on LORS, has never recommended reasonable and prudent measures to minimize and mitigate take, and has never authorized incidental take.

On March 21, 2019 the Corps sent NMFS a letter requesting informal consultation on LORS. A year later, NMFS sent the Corps a letter responding to the Corps' request explaining the agencies initiated informal consultation on January 30, 2020 and explicitly decided to consider the "possible effects from blue-green algae" and "to what extent the releases may be impacting red tide."[78]

NMFS determined LORS was "not likely to adversely affect" sea turtles (green, Kemp's ridley, leatherback, loggerhead, hawksbill), smalltooth sawfish, giant manta ray, and Johnson's seagrass. At 3. NMFS determined LORS would have "no effect" on Nassau grouper, oceanic whitetip shark, and coral (elkhorn, staghorn, boulder star, mountainous star, lobed star, rough cactus, pillar). At 3. NMFS determined that LORS may affect critical habitat for Johnson's seagrass in St. Lucie estuary and critical habitat for smalltooth sawfish, but the effects would be insignificant.[79]

NMFS found that while blue-green algae could stimulate red tide growth in a small area, "such effect does not account for the entire red tide bloom" and that many sources of nutrients fuel red tide. NMFS did not find a correlation between LORS releases and red tide events based on reviewing Corps data from 2015-2018.[80] NMFS concluded that it cannot attribute any specific adverse effects from LORS to listed species and expects they will have only insignificant effects.[81]

A. NMFS' analysis of sea turtles

FWS and NMFS have designated the leatherback, Kemp's ridley, and hawksbill sea turtles as endangered under the ESA, and the Northwest Atlantic Ocean Distinct Population Segments of loggerhead and green sea turtles as threatened under the Endangered Species Act. NMFS has designated migration and reproductive critical habitat for the Northwest Atlantic Ocean Distinct Population Segment of the loggerhead sea turtle near the mouths of the St. Lucie and Caloosahatchee.[82]

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[78] At 1.
[79] At 4, 8.
[80] At 7.
[81] At 7-8.
[82] 79 Fed. Reg. 39756, *Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northwest Atlantic Ocean Distinct Population Segment of the Loggerhead Sea Turtle*, (July 10, 2014); 79 Fed. Reg. 39356, *Endangered and Threatened Species: Critical Habitat for the Northwest Atlantic Ocean Loggerhead Sea Turtle Distinct Population Segment (DPS) and Determination Regarding Critical Habitat for the North Pacific Ocean Loggerhead DPS*, (July 10, 2014).

The southeastern United States has the world's largest number of loggerhead nests, with 90% of nesting in Florida.[83] The majority of the nesting occurs in Brevard, Indian River, St. Lucie, Martin and Palm Beach counties. Loggerhead sea turtles consistently aggregate in Indian River Lagoon.[84] Florida host the second largest aggregation of green sea turtle nesting.[85] Florida is the only state in the continental U.S. where leatherback regularly nest.[86]

NMFS has found that discharges can impact nearshore coral and seagrasses by blocking sunlight necessary for photosynthesis and by contributing to HABs which can smother coral and seagrass, which provide food for sea turtles, and diminish the oxygen content of the water.[87] NMFS has found green sea turtles in Indian River Lagoon exposed to runoff pollution and nutrient discharges have a higher incidence of fibropapillomatosis,[88] as compared to other nearby habitats.[89] NMFS found that red tide and HABs have occurred with increasing frequency throughout the range of the Kemp's ridley, and that heavy blooms kill important prey species like crabs, and directly cause morality.[90] NMFS has found that immature loggerhead and Kemp's ridleys sea turtles exposed to red tide off Florida's west coast showed high concentrations of brevetoxin, and concluded that while "red tide blooms occur naturally, their frequency and persistence may be increasing due to nutrient and chemical run off associated with human activities."[91] NMFS' recovery plan for Kemp's ridley states that red tide and HAB events should continue to be monitored and remedial actions should be developed to minimize the impacts of red tide and HABs.[92] NMFS has stated it does not yet know the population level effects of red tide impacts on loggerheads and green sea turtles.[93]

In its 2020 concurrence letter NMFS acknowledged that LORS may affect sea turtles when LORS influences water conditions in the estuaries, but found that sea turtles in the estuaries "may adjust behavior by moving to another area to seek more optimal water/habitat conditions."[94] NMFS determined "any such behavioral modification by moving to another area…would have minor, insignificant effects on foraging or movement energies." NMFS

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[83] Casale, P. and A.D. Tucker. 2017. Caretta caretta, Loggerhead Turtle. The IUCN Red List of Threatened Species; Ceriani, S.A. and A.B. Melyan. 2017. Caretta caretta (North West Atlantic subpopulation) loggerhead turtle. The IUCN Red List of Threatened Species.
[84] FWC. 2018. Loggerhead Nesting in Florida. (FWC 2018b).
[85] FWC. 2018. Green Turtle Nesting in Florida. (FWC 2018c).
[86] FWC. 2018. Leatherback Nesting in Florida. (FWC 2018d).
[87] *Designated Critical Habitat; Green and Hawksbill Sea Turtle*, 63 Fed. Reg. 46693, 46696 (Sept. 2, 1998).
[88] Fibropapillomatosis is a disease that plagues green sea turtles with tumors.
[89] NMFS. 2015. Status Review of the Green Turtle under the Endangered Species Act at 97.
[90] NMFS. 2008. Recovery Plan for the Northwest Atlantic Population of Loggerhead Sea Turtle. Second Revision, at I-65.
[91] NMFS. Kemp's Ridley Sea Turtle. 2015. 5-Year Review: Summary and Evaluation at 28. Citing Heisler, J. et al. 2008. Eutrophication and harmful algal blooms: a scientific consensus. Harmful Algae 8:3-13; *see also* NMFS. 2008. Recovery Plan for the Northwest Atlantic Population of Loggerhead Sea Turtle. Second Revision, at I-62.
[92] II-17. The Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (*Caretta caretta*) similarly calls for the evaluation of the effects of harmful algal blooms, noting the "insidious sublethal effects, which may be becoming more widespread because of more frequent algal blooms in the coastal zone associated with increased eutrophication." *Id*. at II-64.
[93] *Endangered and Threatened Species; Determination of Nine Distinct Population Segments of Loggerhead Sea Turtles as Endangered or Threatened* 76 Fed. Reg. 58868, 58920 (Sept. 22, 2011); NMFS. 2015. Status Review of the Green Turtle under the Endangered Species Act at 103.
[94] At 4.

reported it reviewed sea turtle stranding data from 2013-2015 for St. Lucie and 2014-2016 for Caloosahatchee, finding no patterns suggesting LORS resulted in strandings.[95] But in the context of blue-green algae blooms, the lack of correlative data regarding strandings over a relatively short time frame does not preclude a finding that there could be a deleterious effect resulting from behavioral modification (which can occur absent an observed "stranding").[96] Indeed, NMFS' own past findings indicate LORS may affect sea turtles. Furthermore, NMFS' look at stranding data over two years is no substitute for any other available science that would support NMFS' position that the behavior modification NMFS predicts would be minor or insignificant. This is especially true when blue-green algae coincides with red tide.

In 2017-2018, in Lee County, FWC documented 404 stranded sea turtles (165 loggerheads, 165 Kemp's ridleys, 67 green turtles, and 7 sea turtles not identified to species). Most (N = 366) were found dead. The previous five-year average number of strandings for Lee County over that period was 101. Red tide was persistent in Lee County November 2017-October 2018 and FWC attributes 260 of the stranded sea turtles in Lee County (127 loggerheads, 114 Kemp's ridleys, and 19 green turtles) to the red tide. In Charlotte County, FWC documented 74 stranded sea turtles (24 loggerheads, 31 Kemp's ridleys, 18 green turtles, and 1 sea turtle not identified to species) November 2017- December 2018. Most (N = 68) were found dead. The previous five-year average number of strandings for Charlotte County over that period was 19. FWC attributed 44 of the stranded sea turtles in Charlotte County (18 loggerheads, 21 Kemp's ridleys, and 5 green turtles) to red tide. NMFS' 2020 concurrence letter did not discuss what role LORS had in influencing sea turtles' behavior during red tide. It did not discuss whether the discharges forced sea turtles into red tide, or how NMFS' assumption that sea turtles "may adjust behavior" in response to LORS "by moving to another area to seek more optimal water/habitat conditions" was or would be impaired when red tide occurs simultaneously, as it did 2017-2018.[97]

Instead, of explicitly analyzing whether red tide would inhibit sea turtles' ability to move to another area in response to LORS discharges, NMFS' 2020 concurrence letter determined "any such behavioral modification by moving to another area…would have minor, insignificant effects on foraging or movement energies." NMFS' 2020 concurrence letter did not consider whether when sea turtles are forced to find more optimal habitat as a result of LORS discharges, those sea turtles actually have any more optimal habitat to escape to during persistent red tide.

NMFS' 2020 concurrence letter also did not provide any analysis as to loggerhead critical habitat, which includes nearshore reproductive habitat from the north end of Captiva/Captiva Island Golf Club and along Sanibel Island West to Tarpon Road from the median high-water line seaward 1.6 km,[98] or the migratory and nearshore reproductive habitat from Floridana Beach to

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[95] At 4-5.
[96] A stranding refers to when a sea turtle is observed dead, injured, or exhibits illness or abnormal behavior. https://www.fisheries.noaa.gov/insight/understanding-marine-wildlife-stranding-and-response.
[97] At 4.
[98] Endangered and Threatened Species: Critical Habitat for the Northwest Atlantic Ocean Loggerhead Sea Turtle Distinct Population Segment (DPS) and Determination Regarding Critical Habitat for the North Pacific Ocean Loggerhead DPS, 79 Fed. Reg. 39856, 39891 (July 10, 2014).

the south end of Indian River Shores, from Fort Pierce inlet to Martin County/Palm Beach County Line.[99]

B. NMFS' analysis of smalltooth sawfish

Smalltooth sawfish are a tropical marine and estuarine fish that was once commonly found in waters throughout Florida and other states in the Southeast. In 2003, NMFS listed the United States population as an endangered distinct population segment under the Endangered Species Act in-part due to habitat destruction from Lake discharges.[100] In 2009, NMFS designated critical habitat, including Charlotte Harbor Estuary in Charlotte and Lee counties.[101] The boundaries go up to the Peace River include the areas around Captiva and Sanibel Island and go up the Caloosahatchee River up to the Franklin Lock and Dam (S-79).[102] NMFS identified red mangroves and shallow euryhaline habitats between the mean high water line and 3 feet.[103] The Corps requested an exemption from the critical habitat rule for LORS, but NMFS declined to provide the exemption, finding LORS may affect critical habitat by altering the shallow habitat.[104]

Currently, sawfish can only be found with any regularity in South Florida between the Caloosahatchee River and the Keys, but have increasingly been observed in the St. Lucie area.[105] It is believed that the population is at a level less than 5% of its size at the time of European settlement.[106]

It is well-documented that freshwater flows influence the movement and distribution of smalltooth sawfish.[107] The fish have an affinity for salinities between 18 and 24 psu, and these salinity levels are impacted by LORS discharges. When the Corps discharges water, "individuals may move to areas with their preferred salinity, but habitats within these areas may be less (or more) suitable than those previously occupied. Within the Caloosahatchee River, increases in salinity that led to [sawfish] occurring upriver of the study area may be most problematic as the river becomes quite narrow with few shallow habitats that species appears to use as a refuge from predation."[108] Flow regimes that result in sawfish being distributed in sub-optimal habitats may reduce the survival "and thus hinder the recovery of this population," for example, by shark

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[99] Endangered and Threatened Species: Critical Habitat for the Northwest Atlantic Ocean Loggerhead Sea Turtle Distinct Population Segment (DPS) and Determination Regarding Critical Habitat for the North Pacific Ocean Loggerhead DPS, 79 Fed. Reg. 39856, 39891 (July 10, 2014).
[100] *Endangered and Threatened Species; Final Endangered Status for a Distinct Population Segment of Smalltooth Sawfish in the United States*, 68 Fed. Reg. 15674, 15676 (April 1, 2003).
[101] Endangered and Threatened Species; Critical Habitat for the Endangered Distinct Population Segment of Smalltooth Sawfish, 74 Fed. Reg. 45353, 45373-74, 76 (Sept. 2, 2009).
[102] *Id.* at 45374.
[103] *Id.* at 45373-74.
[104] *Endangered and Threatened Species; Critical Habitat for the Endangered Distinct Population Segment of Smalltooth Sawfish*, 74 Fed. Reg. 45353, 45361 (Sept. 2, 2009).
[105] Killer, E. Shark survey scientist finds two sawfish in eight days. TC Palm. Apr. 18, 2019.
[106] Smalltooth Sawfish Recovery Plan, National Marine Fisheries Service (Jan. 2009) at v.
[107] Simpfendorfer, C.A. 2011. Environmental Influences on the Spatial Ecology of Juvenile Smalltooth Sawfish (*Pristis pectinate*): Results from Acoustic Monitoring. PloS One 6(2).
[108] Simpfendorfer, et al. at 10.

predation.[109] Water management practices that result in repeated large changes in flow over short periods of time will "result in large amounts of movement between different habitats which will increase energy expenditure, and may expose individuals to greater risks of predation….Water management practices therefore need to be considered in relation to the recovery of the [sawfish] population."[110]

One of the three main objectives of the 2009 Smalltooth Sawfish Recovery Plan is to protect and/or restore sawfish habitats.[111] One of the criteria that must be met for both the down-listing and de-listing of the species states:

> Freshwater flow regimes (including timing, distribution, quality, and quantity)…are appropriate to ensure natural behavior (e.g., feeding, resting, and predator avoidance) by maintaining salinities within preferred physiological limits of juvenile smalltooth sawfish.[112]

The Recovery Plan further calls for NMFS to "minimize the disruption of natural/historic freshwater flow regimes (including timing, quality, and quantity) and maintain or restore water quality to restore the long-term viability of the smalltooth sawfish."[113] It notes that red tide "could lead to widespread mortality of juveniles. Thus, to adequately recover the population, it will be necessary to ensure that sufficient nursery areas are available."[114] NMFS' 2018 status review concluded that "it remains unclear whether or not" LORS are threatening sawfish recovery,[115] and recognized that red tide has "the potential to impede both survival and recovery directly if animals die as a result of them or indirectly if important habitats are damaged."[116]

In its 2020 concurrence letter, NMFS acknowledged that LORS could result in changes to water quality that could cause sawfish to move from one area to another less preferred or safe area and may result in habitat changes.[117] NMFS then concluded that NMFS has no information to suggest adverse effects from LORS, and therefore expects any impacts to be insignificant, in part because NMFS believes that there is sufficient and appropriate habitat to allow such movement so that it will not result in adverse effects.[118] NMFS did not consider whether when LORS causes sawfish to move, whether sawfish have available habitat, particularly nursery and juvenile habitat, during year-long persistent red tide that co-occurs with blue-green algae.

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[109] *Id*. at 11; *See* NMFS. Smalltooth sawfish 5-year review: summary and Evaluation of United States Distinct Population Segment of Smalltooth Sawfish. finding that CERP has the potential to restore habitats and hydrology reducing the risk of predation by sharks, at 33.
[110] *Id*.
[111] *See* Smalltooth Sawfish Recovery Plan at III-3.
[112] Recovery Plan at III-4, III-5. The criterion for delisting reads almost verbatim: "Freshwater flow regimes (including timing, distribution, quality, and quantity)…are appropriate to ensure natural behavior (e.g., feeding, breeding, and pupping) by maintaining salinities within preferred physiological limits of juvenile smalltooth sawfish."
[113] Smalltooth Sawfish Recovery Plan at III-4. *See also,* Recovery Plan at ix, IV-9, IV-22.
[114] *Id.* at IV-14.
[115] NMFS. Smalltooth Sawfish 5-Year Review: Summary and Evaluation of United States Distinct Population Segment of Smalltooth Sawfish at 26.
[116] *Id.* at 42.
[117] At 5.
[118] *Id.*

C. NMFS' analysis of Johnson's seagrass

Johnson's seagrass (*Halophila johnsonii*) is listed as threatened under the Endangered Species Act. It is found on the east coast of Florida from Sebastian Inlet to central Biscayne Bay.[119] NMFS designed critical habitat for the aquatic plant in 2000.[120] This designation identifies those physical and biological features of the habitat that are essential to the conservation of the species and that may require special management consideration or protection.[121] Critical habitat for Johnson's seagrass lies in waters directly impacted by the discharges and harmful algae blooms, including the St. Lucie Inlet, Fort Pierce Inlet, and Hobe Sound.[122]

NMFS recognized the benefits of designating critical habitat for the species, for example, the agencies identified disposal of water adjacent to a critical habitat area as an activity that may affect an essential feature of the designated habitat (water quality) and would be subject to Section 7.[123] Indeed, NMFS in the past has believed that special management may be required because of among other things, water pollution and land use practices including shoreline development, agriculture, and aquaculture posed a risk to the species.[124]

Water quality was a primary area of concern for NMFS in designating critical habitat. In promulgating the final rule designating critical habitat for the species NMFS wrote:

> Decreased water transparency caused by suspended sediments, water color, and chlorophylls could have significant detrimental effects on the distribution and abundance of the deeper water populations of Johnson's seagrass. A distribution survey in Hobe and Jupiter Sounds indicates that the abundance of this seagrass diminishes in the more turbid interior portion of the lagoon where reduced light limits photosynthesis.
>
> Other areas of concern include seagrass beds located in proximity to rivers and canal mouths where low salinity, highly colored water is discharged. Freshwater discharge into areas adjacent to seagrass beds may provoke physiological stress upon the plants by reducing the salinity levels. Additionally, colored waters released into these areas reduce the amount of sunlight available for photosynthesis by rapidly attenuating shorter wavelengths of Photosynthetically Active Radiation.
>
> Also continuing and increasing degradation of water quality due to increased land use and water management threatens the welfare of seagrass communities. Nutrient over-enrichment caused by inorganic and organic nitrogen and phosphorus loading via urban and agricultural run-off stimulate increased algal

[119] Designated Critical Habitat: Critical Habitat for Johnson's Seagrass, National Oceanic and Atmospheric Administration, 65 Fed. Reg. 17786, 17786-17804 (April 5, 2000).
[120] 65 Fed. Reg. 17786-17804.
[121] 65 Fed. Reg. 17787.
[122] https://www.fisheries.noaa.gov/resource/map/johnsons-seagrass-critical-habitat-map-and-gis-data.
[123] 65 Fed. Reg. 17787.
[124] *See* 65 Fed. Reg. 17778.

> growth that may smother Johnson's seagrass, shade rooted vegetation, and diminish the oxygen content of the water. Low oxygen conditions have a demonstrated negative impact on seagrasses and associated communities.[125]

NMFS specifically identified LORS as among the range of federal actions that may affect the essential habitat requirements of Johnson's seagrass,[126] and in its most recent 5-year review found that "discharges from Lake Okeechobee have had significant impacts on water quality and seagrasses" near the St. Lucie Inlet.[127] It found that Johnson's seagrass "could be seriously affected by salinity variations produced by human activities, such as freshwater discharges through water management practices."[128] In designating critical habitat for the species, NMFS found that freshwater discharges can stress the plant by reducing the salinity level and reducing the amount of sunlight available for photosynthesis,[129] and that nutrient over-enrichment caused by phosphorous and nitrogen loading "stimulate increased algal growth that may smother Johnson's seagrass, shade rooted vegetation, and diminish oxygen content of water" as low oxygen conditions have had a demonstrated negative impact on seagrasses.[130]

From 1980-2018, the annual average percent of total suspended solids from the Lake to the St. Lucie, as compared to local basin runoff, was 56%, with significant spikes under LORS 2008 in 2010 (63%), 2013 (81%), 2016 (83%), 2017 (91%), and 2018 (85%). From data taken at the S-77, Lake discharge of total suspended solids to the Caloosahatchee estuary as compared to C-43 basin runoff average was 64%, with significant spikes under LORS 2008 in 2010 (100%), 2012 (69%), 2013 (72%), 2015 (100%), 2016 (100%), 2017 (100%), and 2018 (100%).

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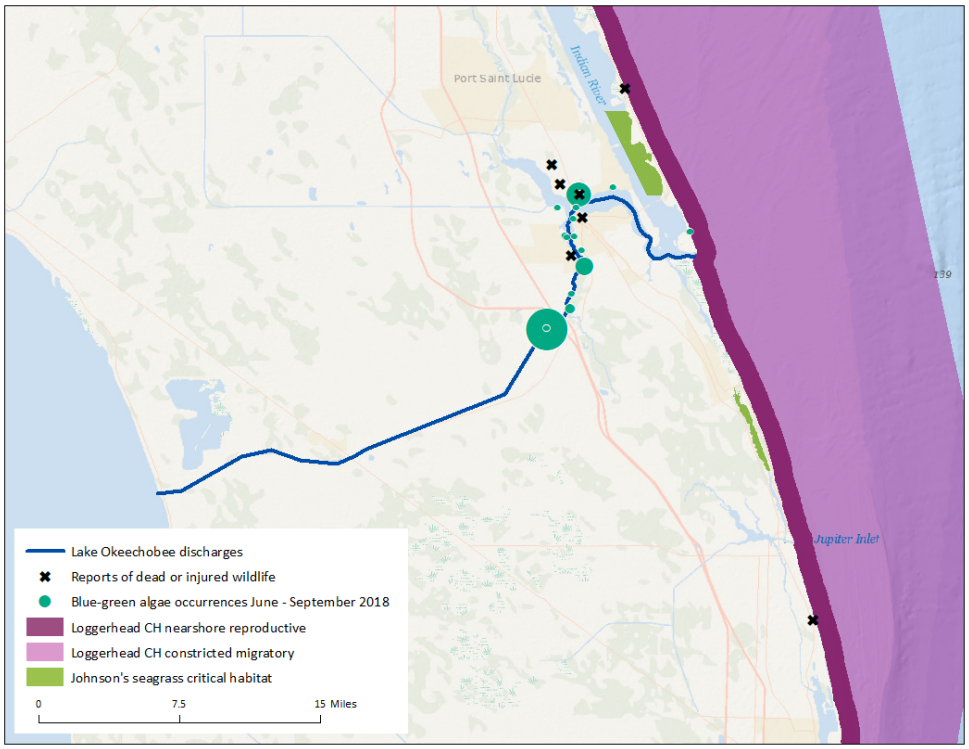
[125] 65 Fed. Reg. 17788.
[126] 65 Fed. Reg. 17788-17789.
[127] NMFS. 2007. Endangered Species Act 5-Year Review Johnson's Seagrass, at 23.
[128] *Id.* at 11.
[129] *Designated Critical Habitat: Critical Habitat for Johnson's Seagrass*, 65 Fed. Reg. 17786, 17788 (Apr. 5, 2000).
[130] *Id.*



Map depicting the St. Lucie river and estuary, blue-green algae in 2018, reported wildlife casualties, and loggerhead sea turtle and Johnson's seagrass designated critical habitat.

In its 2020 concurrence, NMFS found that LORS may stress plants by lowering salinity and through algae that can smother the understory of seagrass, shade rooted vegetation, and diminish oxygen in water.[131] NMFS stated that, nonetheless, it expects the seagrass will withstand stress from LORS, and that it has no records that the releases have resulted in significant impact. NMFS did not mention total suspended solids or impacts from them.

V. THE AGENCIES' VIOLATIONS OF THE ENDANGERED SPECIES ACT

NMFS' concurrence letter, and the Corps' unlawful reliance on it, violate the Endangered Species Act because:

1. The avoidance behavior and habitat impacts described in the 2020 concurrence letter meets the low threshold for the ESA's mandate to initiate formal consultation when a project "may affect" a listed species and is "likely to adversely affect" listed species (and in fact, fits the plain definition of "take" under the Act);
2. NMFS never addressed what happens to sea turtles, smalltooth sawfish, and giant manta rays when LORS forces them to seek more optimal habitat when a persistent red tide has rendered nearby habitat inhabitable, as occurred 2017-2018;

[131] At 6.

3. NMFS did not at all address how LORS impacts loggerhead migratory and reproductive critical habitat;
4. NMFS did not address LORS' contribution of total suspended solids to the St. Lucie (which are at times 100%) impacts Johnson's seagrass or Johnson's seagrass critical habitat;
5. NMFS ignored the best available science indicating LORS "may affect" and is in fact "likely to adversely affect" listed species.

"Take" under the ESA is broadly defined to include to "harass," "harm," "wound," and "kill." 16 U.S.C. § 1532(19). "Harm" encompasses significant habitat modification or degradation such that it significantly impairs essential behavioral patterns, including breeding, feeding or sheltering, and "harass" means any act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns including, but not limited to breeding, feeding, and sheltering. 50 C.F.R. § 17.3; *Marbled Murrelet v. Babbitt*, 83 F.3d 1060, 1066 (9th Cir. 1996). The avoidance behavior NMFS predicts in its 2020 concurrence letter is precisely the sort of harm Congress envisioned in enacting the Act. If a project "may affect" listed species or their critical habitats and the best available science does not support a "not likely to adversely affect" determination, the agencies must engage in formal consultation and NMFS must prepare a biological opinion. 50 C.F.R. §§ 402.12(g), 402.14(a); *Fla. Key Deer v. Brown*, 364 F. Supp. 2d 1345, 1353 (S.D. Fla. 2005).

Moreover, the well-documented harms from red tide, that occurred at the same time and place as the Corps' harmful LORS discharges, warrant review under the Endangered Species Act, and NMFS completely failed to acknowledge that significant impact. Formal consultation would culminate in a biological opinion, something NMFS has never done despite the 12-year lifespan of this project. A biological opinion would evaluate the nature and extent of the effects of the action on the species and their habitat, including measures to mitigate the impacts of any death, injury, or harm to species. 50 C.F.R. § 402.14(m)(1).

NMFS is required to evaluate whether a project "may affect" listed species or their critical habitats and make a NLAA determination based on the best available science. 50 C.F.R. §§ 402.12(g), 402.14(a). Here, the NMFS completely failed to so much as mention the nearshore reproductive and migratory critical habitat for loggerheads sea turtle. Furthermore, NMFS' 2020 concurrence letter found that LORS "may affect" smalltooth sawfish and Johnson's seagrass critical habitat, but concluded, without the benefit of a biological opinion, that the effects would be "insignificant."

Finally, the Corps has an independent, substantive duty under Section 7 of the ESA to ensure that its actions are not likely to jeopardize listed species or adversely modify their critical habitat.[132] NMFS' 2020 concurrence letter on LORS violates the ESA and APA and is unlawful; therefore, the Corps' reliance on NMFS' concurrence letter to fulfill its Section 7 procedural and

[132] 16 U.S.C. § 1536(a)(2).

substantive violations is also arbitrary, capricious and violates the ESA.[133] Without a biological opinion from NMFS and accompanying "incidental take statement" including "reasonable and prudent measures" and "terms and conditions" to minimize impacts and incidental take, the Corps does not have incidental take authorization, and therefore, the Corps' actions under LORS violate Section 9 of the ESA by causing unauthorized take.[134]

For the above stated reasons, the NMFS and the Corps have violated and remain in violation of Sections 7 and 9 the ESA. If these violations are not cured within sixty days, Center for Biological Diversity, Calusa Waterkeeper, and Waterkeeper Alliance intend to file suit for declaratory and injunctive relief, as well as attorney and expert witness fees and costs. This notice letter was prepared based on good faith information and belief after reasonably diligent investigation. If you believe that any of the foregoing is factually erroneous or inaccurate, please notify me promptly at 727-490-9190 or jlopez@biologicaldiversity.org.

Sincerely,

Jaclyn Lopez
Senior Attorney
Center for Biological Diversity

Jason Totoiu
Senior Attorney
Center for Biological Diversity

[133] *Id.*; *Center for Biological Diversity v. Salazar*, 804 F.Supp.2d 987, 1010 (D. Ariz. 2011) (holding an action agency's reliance on a legally flawed biological opinion is arbitrary and capricious).
[134] 16 U.S.C. § 1536(b)(4); 16 U.S.C. § 1538.